

COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

April 12, 2017

Facilitator's Summary

Facilitator: Emily Stranz; Notes: Charles Wiggins, DS Consulting

The following Facilitator's Summary is intended to capture basic discussion, decisions and actions, as well as point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the "record" of the meeting, only a reminder for TMT members. Official minutes can be found on the TMT website: <http://www.nwd-wc.usace.army.mil/tmt/agendas/2017/>

Official Water Supply Forecast

The Corps and Bureau of Reclamation reported on the official April water supply forecasts: Mary Mellema, BOR, reported:

- Hungry Horse inflow forecast:
 - April- July: 1,955kaf (105% of average)
 - Jan-July: 2,407 kaf (115% of average)
 - April-Aug: 2,023kaf (105% of average)
 - May-Sept: 1,778 kaf (105% of average)

Doug Baus, Corps, reported:

- The Dalles: April-Aug: 105maf (120% of average) ; since the Official forecast, TDA had a 4% increase to 124% of average)
- Lower Granite: April – July: 28maf (143% of average); since the Official forecast, LGR had a 1% increase to 144% of average)
- Libby: April-Aug: 7,654kaf (130% of average)
- Dworshak: April-July: 2,984kaf (122% of average)
- Grand Coulee: April- Aug: 65maf (114% of average)
- Albeni Falls: April-Aug: 16maf (116% of average).

Doug also reported on the Climate Forecasts:

- For the remainder of this week, rain is expected in the Columbia River Basin, drying out towards the weekend, followed by increased precipitation and cooler temperatures.
- The 6-10 and 8-14 day temperature is forecast to be below average, and the precipitation is above average.
- The 30 day temperature is forecast to be near normal, and the precipitation is above average on the West side of the Cascades, and near normal on the East side of the Cascades.

Little Goose Bulkhead Storage

Ann Setter and Lisa Wright, Corps, shared that the bulkhead at Little Goose (LGS) will be stored today (4/12), two units are expected to be out through July at Lower Monumental (LMN), and thus the flow trigger for involuntary spill and the uniform pattern is approximately 102kcfs. Current forecasts indicate LMN inflow will be above that threshold for involuntary spill through mid-June. Based on this situation, the Salmon Managers did not feel that there is a need to hold the LGS pool above MOP (previously TMT had discussed holding above MOP, as a way to extend the uniform spill pattern at LMN). As such, the TMT agreed to return LGS to MOP after the bulkhead is stored. The Corps expects to move an additional 5kcfs/day from LGS, which would take about 4 days to return to MOP.

→ **ACTION:** The Corps will return LGS pool to MOP after completion of bulkhead storage.

Contingency Reserves Proposal

The TMT discussed BPA's proposal to hold contingency reserves above the 1% range at McNary and The Dalles to allow them to operate within the full 1% range and decreasing TDG levels in the river. As requested by Salmon Managers, Tony Norris, BPA, provided additional explanation and a diagram illustrating the concept (available on the TMT website).

Salmon Managers expressed appreciation for the information and potential tool to use to limit TDG. They noted that at this point, the TDG levels in the river are not causing significant gas bubble trauma. Sample sizes are small, however, monitoring shows mostly lower levels of GBT, with 2-5% of fish sampled showing GBT impacts. The Salmon Managers will continue to monitor TDG and GBT over the coming weeks. It was estimated that the proposal would decrease TDG by 1-2% in the river, and at this point, the limited benefit to TDG does not warrant the increased risk of passing fish through the turbines. Salmon Managers plan to gather more information on turbine passage at The Dalles and impacts to gateway turbulence in the coming weeks. The Salmon Managers said that they are not supportive of increasing powerhouse passage and if TDG impacts increase they will explore potential methodologies to address them.

Dworshak Unit 3 Outage Update

The Corps reported that the current schedule is for a Unit 3 return to service in mid to late-July. They are in the process of reviewing the status of the stator bars with the contractor and will bring an update to the TMT when available.

It was noted that the Unit 3 outage impacts in season management of summer operations and thus an update and continued conversation is vital. Steve Hall, Corps, suggested that the TMT coordinate around summer operation priorities, pending continued Unit 3 outage, as soon as possible.

→ **ACTION:** The TMT will discuss DWR summer operation priorities.

The next TMT meeting is a face to face meeting at 9:00 PM on Wednesday, April 19, 2017.

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

April 12, 2017
Minutes: Pat Vivian

1. Introduction

Representatives of BPA, NOAA, COE, BOR, Washington, USFWS, CRITFC/Umatilla, Idaho, Nez Perce Tribe, Colville Tribe, Oregon and others participated in today's TMT meeting chaired by Doug Baus, COE, and facilitated by Emily Plummer, DS Consulting.

2. Official Water Supply Forecasts

Doug Baus, COE, and Mary Mellema, BOR, reported the official April water supply volume forecasts for individual basins:

- Hungry Horse (April-July) – 1,955 kaf, 105% of average
(January-July) – 2,407 kaf, 115% of average
(April-August) – 2,023 kaf 105% of average
(May-September) – 1,778 kaf 105% of average
- The Dalles (April-August) – 105 maf, 120% of average
- Lower Granite (April-July) – 28 maf, 143% of average
- Libby (April-August) – 7,654 kaf, 130% of average
- Dworshak (April-July) – 2,984 kaf, 122% of average
- Grand Coulee (April-August) – 65 maf, 114% of average
- Albeni Falls (April-August) – 16 maf, 126% of average

2b. The Dalles Dam Current Water Supply Forecast. The latest inflow forecast for The Dalles (April-August) is 124% of average, a 4% increase since the official forecast was released on the third working day of the month (April 3).

2c. Lower Granite Dam Current Water Supply Forecast. The latest inflow forecast for Lower Granite (April-July) is 144% of average, a 1% increase since the official forecast was released on the third working day of the month (April 3). Baus noted there's a general trend of inflow forecasts increasing.

2d. 10 Day Weather Forecasts. The near term forecast (April 13-14) calls for 0.10-0.50 inch of precipitation throughout the basin, with higher levels at the northern end of the Cascades. On April 15 there will be a dry spell, then relatively cool temperatures and increased precipitation for the remainder of the 10 day period.

2e. Climate Forecasts. According to the RFC's 6-10 day forecast, temperatures will be below average and precipitation above average. The same pattern holds true for the 8-14 day forecast.

The 30-day longer term forecast released on March 31 shows temperatures near normal, with above average precipitation west of the Cascades and near normal precipitation east of the Cascades including Idaho and western Montana.

3. Little Goose High Pool for Floating Navigation Lock Bulkhead

As a follow-up to last week's TMT discussion regarding when to return Little Goose Dam to MOP operations after floating the bulkhead into storage, Ann Setter reported that the bulkhead storage is in progress now. Two units at Lower Monumental will remain out of service through the end of July. The possible causes of problems at unit 4 are being investigated.

LMN Unit 5 is scheduled to return to service at the end of July, unit 1 at the end of September. These two unit outages reduce LMN turbine capacity and impact TDG levels downstream. Unit 4 had an oil leak, but that has been fixed without taking the unit OOS.

Lisa Wright, COE, described the point at which Lower Monumental would transition from bulk to uniform spill for involuntary spill. When flows exceed turbine capacity and the project is spilling involuntarily above its gas cap, the operation switches from a bulk to a uniform spill pattern. With all 6 units at Lower Monumental operating, the threshold to switch from bulk to uniform spill is when total flows exceed approximately 140 kcfs. With two units out of service, the threshold is approximately 102 kcfs. The project has been spilling involuntarily and using the uniform spill pattern all year. Current STP projections indicate that flows will remain above 102 kcfs until June 21, at which point the Lower Monumental operation would switch to bulk spill.

Paul Wagner, NOAA, reported on FPAC's discussion yesterday regarding the return to MOP operations at Little Goose. With only four units in service at Lower Monumental, the consensus was to return Little Goose to MOP as soon as the bulkhead is stored. Russ Kiefer, Idaho, followed up on the proposal he presented to TMT last week that the extra water at Little Goose be stored for use later to extend involuntary spill and the uniform spill pattern at Lower Monumental.

Under current conditions, with plenty of water to maintain a uniform spill pattern until June, FPAC agreed that departure from the default return to MOP is unnecessary. Therefore, FPAC is recommending that once the bulkhead is stored, Little Goose begin drafting on a regular release schedule down to its MOP range of 633-634 ft elevation. The return to MOP is expected to take about 5 days at a draft rate of 5 kcfs per day. Drafting to MOP will begin at about noon today as soon as the bulkhead is stored.

4. Contingency Reserves Proposal

Last week Tony Norris, BPA, introduced TMT to the concept of contingency reserves, and several members said more information was needed to clarify the proposed operation. So today Norris presented a graphical depiction of how BPA proposes to hold contingency reserves (which are used less than 4% of the time) above the 1% range at The Dalles to McNary Dam to allow units to operate within the full 1% range. TMT members said the graphs made the proposal much more understandable than it was last week.

The concept of allowing contingency reserves above 1% of turbine capacity at McNary is only relevant to the current condition, with all projects spilling past turbine capacity and exceeding their gas caps. Because McNary has the least amount of turbine capacity of any project in the lower Columbia, it is operating at full load at the upper 1% of its range and carrying no reserves.

Typically BPA carries reserves – deployed only in the event of a resource outage – at Grand Coulee and Chief Joseph, but both are having trouble drafting enough to meet their flood control requirements. Meanwhile, in order to carry contingency reserves, John Day and The Dalles are not generating to their full upper 1% range. That increases spill and TDG levels in the river for the sake of system reliability. Carrying contingency reserves above 1% at McNary would reduce spill and TDG.

Contingency reserves don't get deployed unless a system resource fails, which in 2016 was less than 4% of the hours in any month. Most deployments are less than an hour. If the proposal were implemented, the risk of passing more fish through the turbines would be marginal at 2-4% of all hours in a month, while the TDG benefits would be ongoing and impact all fish. It was noted that this type of tool for reducing TDG levels is only applicable when spill levels are high and projects are exceeding their gas caps.

Paul Wagner, NOAA, reported on FPAC's discussion of the proposal yesterday. While the concept is better understood now than it was last week, the consensus remains the same: FPAC does not support increased turbine passage because turbine-passed smolts have lower rates of survival. The impacts of TDG appear to be minimal at this time, so the Salmon Managers view turbine passage as the greater risk of the two. Of fewer than 100 fish sampled on April 10 at Bonneville, 9% of the steelhead and 6.7% of Chinook had GBT level 2 symptoms. Other than that, most of the symptoms have been Level 1, the mildest category. Lower Monumental fish had zero incidence of GBT on April 6 and again on April 9. Data to date suggest that fish are beginning to show cumulative effects of TDG by the time they reach Bonneville. However, it appears the peak has passed and flows are decreasing. In early April when spill was in excess of 125% TDG, the incidence of GBT was as high as 3-4%.

FPAC will keep a close eye on smolt sampling data for GBT symptoms, Wagner said. Norris asked whether there is a point at which the Salmon Managers would reconsider the proposal as a tool for TDG management. What if flows, TDG, and observed GBT increase?

Wagner explained that more information is needed on how turbine-passed fish fare at The Dalles. An ERDC trip in the next few months will provide insight on turbulence in the gatewells. Although a small percentage of fish pass through turbines at The Dalles, higher levels of spill are generally less efficient in terms of smolt passage. When flows are high, spill percentages need to be high in order to achieve the same passage efficiency.

If spill and TDG levels increase, the Salmon Managers would definitely revisit the proposal, Wagner said. It could turn out to be a valuable tool if the spring freshet is yet to come. Russ Kiefer, Idaho, and Charles Morrill, Washington, thanked BPA for offering the Salmon Managers a tool that can be deployed if necessary.

Tom Lorz, CRITFC/Umatilla, asked how to quantify the TDG benefits at a given volume of spill reduction. How much would it take to reduce TDG at The Dalles or John Day? There's a big difference in spill caps between the two projects, Laura Hamilton, COE, replied. For example, 40 kcfs of spill reduction at The Dalles would yield less than 1% reduction in TDG, while the same spill reduction at John Day would reduce TDG by 2-3% saturation.

BPA can move contingency reserves from one project to another, wherever spill reduction would provide the most benefit, Norris said. The reach from McNary to John Day tends to degas the river, Hamilton said, while the reach from John Day to Bonneville provides little degassing opportunity. Implementing the proposal at The Dalles would reduce TDG in the Bonneville forebay, where it might be most useful.

Erick Van Dyke, Oregon, reiterated that FPAC does not support increasing fish passage through the powerhouse at this time. Julie Ammann, COE, said the Action Agencies already have the ability to operate the projects up to the upper 1% of turbine capacity, which they are not doing. So implementing the proposal would actually involve two steps – operating the turbines to the upper limit of the 1% range, and exceeding the 1% range at McNary 2-4% of the hours when reserves are utilized.

Modeling to date suggests that bypassing smolts improves survival in the ocean by 12% over turbine passage, Charles Morrill said. That's why the Salmon Managers are intent on minimizing turbine passage.

5. Dworshak Milestone Update

At last week's TMT meeting, Oregon requested an update on the Dworshak unit 3 overhaul, Van Dyke reminded everyone. The COE is in the process of examining the shipment of bars with the contractor and is not at liberty to discuss the schedule publicly until the process is complete. Information will be available hopefully within a few weeks, Hall said. Until then, unit 3 will return to service in mid to late July according to the contractor's schedule.

The Salmon Managers need updates on the unit 3 RTS because it will have a big impact on decision making for summer operations, Lorz said. Hall recommended that sometime before the end of June, TMT have a conversation about balancing TDG concerns with temperature management this summer. Temperature augmentation flows will probably be needed before unit 3 returns to service at the earliest in late July.

Sheri Sears, Colville Tribe, asked what the April 30 flood control elevation is for Grand Coulee. It's 1222.7 ft, Norris replied.

6. Next TMT Meeting

TMT will meet next in person on April 19.

<i>Name</i>	<i>Affiliation</i>
Scott Bettin	BPA
Paul Wagner	NOAA
Julie Ammann	COE
Doug Baus	COE
Mary Mellema	BOR
Tony Norris	BPA
Charles Morrill	Washington
Dave Swank	USFWS
Tom Lorz	CRITFC/Umatilla
Russ Kiefer	Idaho
Jay Hesse	Nez Perce
Dave Lyman	PGE
Michael Bryant	CBB
Brian Zigler	Snohomish PUD
Shane Scott	PPC
Natalie Richards	COE
Charles Wiggins	DSC
Lisa Wright	COE
Aaron Marshall	COE
Laura Hamilton	COE
Dan Turner	COE
Ron Thomason	COE

Ann Setter
Sheri Sears
Dave Benner
Erick Van Dyke
Steve Hall

COE Walla Walla
Colville Tribe
FPC
Oregon
COE Walla Walla